Microbiology

NORMAL MICROBIAL QUALITY OF RAW AND PASTEURISED MILK AND DERIVED PRODUCTS.

Food Microbiology

Food microbiology is the study of the microorganisms that inhibit, create or contaminate food including the study of microorganisms causing food spoilage pathogens that may cause disease especially if food is improperly cooked or stored.

Those use to produce fermented foods such as,

- Cheese
- Yoghurt
- Bread
- Beer and Wine etc.

Food safety is the major focus of food microbiology

Raw milk is milking from;

- Cows
- Goats
- Sheep
- Buffalo

Condition needs for growth microorganisms in milk

- High water content
- Have gasses such as O2
- Temperature- most grow best at body temperature
- PH value
- High nutrition value

Dangers of raw milk

Milk and milk product provide a health of nutrition benefits. But raw milk can harbor dangerous microorganisms that can pose serious health risk to human.

Microorganisms of concern in milk

Unpasteurized milk can carry dangerous bacteria parasites and viruses, such as

- *Listeria*
- *Monocytogene*
- *Escherichia coli*
- *Coxiella burnetti*
- *Coaliforms*
- *Comphylobacter jejuni*
- *Brucella spp*

- *Mycobacterium bovi*
- *Tuberculosis*
- *Micobacterium paratuberculosis*
- *Salmonella spp*
- *Yerstnia enterocolitica*

These harmful bacteria can seriously affect the health of anyone who drink raw milk or eat food made from raw milk

Spoiled milk

Milk Testing And Control

- There are some testing for ensure.The milk “meet accepted” standards for microorganisms
  - Sampling milk for bacteriological testing's.
  - Clot on boiling test
  - The aiconal test
  - Acidity test
  - Inhibitor test

Definition of pasteurized milk

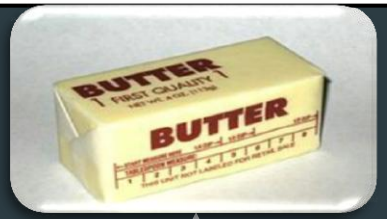
- Milk that has been exposed briefly to high temperatures to destroy microorganisms and prevent fermentation

Storage of pasteurized milk

- Store in under 4 degree C can keep five to seven days.
- Up to four hours at room temperature if unopened.
- Should store in the refrigerator.
- FIFO stock rotation.

Milk Products

BUTTER



MILK

ICE CREAM

YOGHURT

GHEE

CURD

MILK POWDER

CHEESE

Cheese

- Cheese is a dairy product derived from milk that is product in a wide range of flavour,texture and forms by coagulation of the milk protein casein.
- More commonly starter bacteria are employed instead which convert milk sugars in to lactic acid.
- Most cheese are made with starter bacteria from the ***Lactococcus , Lactobacillus*** or ***Streptococcus*** families.

- For a good shelf-life cheese, techniques such as fermentation and pasteurization. Lactic acid bacteria are very important for flavor.
- Many different microbes are used to create many different cheese
- Bacterium propionic bacterium-added to curds to make Swiss cheese

Butter

- Butter is dairy product containing up to 80% butter fat which is solid when chilled and at room temperature in some regions and liquid when warmed. It is made by churching fresh or fermented cream or milk to separate the butterfat from the butter milk.

- The bacteria are from the bacilli type of *Lactobacillus* which include *Streptococcaceas* (parent of *Streptococcus* & lactic *Streptococcus* called *Lactococcus*)and *Levconostoc* cat right. The culture commonly used mixture for butter is *Lactococcus lactic* subsp.

- Butter is usually made from pasteurized cream whose fermentation is produced by the introduction of *Lactococcus* and *Leuconostoc* bacteria.

Curd

- Curds are a dairy product. Usually prepared from cow milk and buffalo milk. Curd is made by bacterial fermentation of milk.

- In this process *Lactobacillus* bacteria in milk that changes milk to curd. When milk is heated to a temperature of 30-40 degrees centigrade and a smack amount of old curd added to it, the *Lactobacillus* in that curd sample gets activated and multiplies. These convert lactose in it lactic acid.

❖Lactose —*Lactobacillus*→ Lactic acid

❖This fermentation depends on the temperature and humidity of the environment.

Yoghurt

- Yoghurt is a food produced by bacteria fermentation of milk. The bacterial used to make yoghurt are known as yoghurt cultures.
- Fermentation of lactose by these bacteria product lactic acid which acts on milk protein to give yoghurt its texture and characteristic tart flavor.
- Cows milk is available worldwide & commonly use to make yoghurt.
- The species of bacteria used in yoghurt are *Streptococcus thermophillus* & *Lactobacillus bulgaricus*.

- These species eat the sugar in milk. Then the bacteria product lactic acid. Lactic acid makes milk protein curdle

Sour cream

- Sour cream is a dairy product obtained by fermenting regular cream with certain kinds of lactic acid bacteria.
- Fermentation of sour cream production are *Lactococcus lactic*. They are lactic acid bacteria.

Ice cream

- Usually made from dairy product such as milk & cream other ingredients and flavors.

Tetra pack milk

- Filled immediately milk in to a sterilized tetra pack carton which is shelf safe. Does not require boiling.


Thank You!